

CLAIMS

- 1 1. A method of classifying an image, the method comprising:
2 obtaining an image;
3 determining one or more classification thresholds;
4 determining the concentration ratio for the image;
5 comparing the concentration ratio to at least one of the one or more classification
6 thresholds; and
7 classifying the image based on the comparison of the concentration ratio to at least
8 one of the one or more classification thresholds.
- 1 2. A method as claimed in claim 1 wherein determining the concentration ratio for the
2 image includes determining the luminance components of pixels in the image.
- 1 3. A method as claimed in claim 1 wherein determining the concentration ratio for the
2 image includes determining the grayscale components of the image.
- 1 4. A method as claimed in claim 1 wherein determining the concentration ratio for the
2 image includes generating a histogram for the image.
- 1 5. A method as claimed in claim 1 wherein determining one or more classification
2 thresholds includes a training process.
- 1 6. A method as claimed in claim 1 wherein the training process includes analyzing a set
2 of images having known classifications.
- 1 7. A method as claimed in claim 1 wherein analyzing a set of images having known
2 classifications includes determining a concentration ratio for each image in the set of images.
- 1 8. A method as claimed in claim 1 wherein determining the concentration ratio for each
2 image in the set of images includes generating a histogram for each image.
- 1 9. A method as claimed in claim 1 wherein determining one or more classification
2 thresholds includes determining a threshold for text images and a threshold for photographic
3 images.

10. A method as claimed in claim 1 wherein classifying the image based on the comparison of the concentration ratio to at least one of the one or more classification thresholds is performed according to the following

If (CR < T) image type = text

If (T ≤ CR < P) image type = graphic

If (P ≤ CR) image type = photographic

where CR is a concentration ratio of the image, T is a threshold for text images and P is a threshold for photographic images.

11. A method as claimed in claim 1 wherein determining the concentration ratio for the image includes determining the concentration ratio according to the following

$$CR = \left(\sum_L P_L \right)^n \bigg/ \left(\sum_L P_L^n \right)$$

where CR is a concentration ratio, n is greater than 1, and P_L is a population at a level L.

12. A method as claimed in claim 1 wherein n is an even integer.

13. An image classifying processor, the processor configured to obtain an image, obtain one or more classification thresholds, determine a concentration ratio for the image, compare the concentration ratio to at least one of the one or more classification thresholds, and classify the image based on the comparison of the concentration ratio to at least one of the one or more classification thresholds.

14. An image classifying processor as claimed in claim 1 wherein the processor is configured to determine the luminance components of pixels in the image.

15. An image classifying processor as claimed in claim 1 wherein the processor is configured to determine the grayscale components of the image.

16. An image classifying processor as claimed in claim 1 wherein the processor is configured to generate a histogram for the image.

17. An image classifying processor as claimed in claim 1 wherein the processor includes a memory and the memory includes a threshold for text images, and a threshold for photographic images.

18. An image classifying processor as claimed in claim 1 wherein the processor is configured to classify the image based on the comparison of the concentration ratio to at least one of the one or more classification thresholds according to the following

If (CR < T) image type = text

If (T ≤ CR < P) image type = graphic

If (P ≤ CR) image type = photographic

where CR is a concentration ratio of the image, T is a threshold for text images, and P is a threshold for photographic images.

19. An image classifying processor as claimed in claim 1 wherein the processor is configured to determine the concentration ratio for the image according to the following:

$$CR = \left(\sum_L P_L \right)^n / \left(\sum_L P_L^n \right)$$

where CR is a concentration ratio, n is greater than 1, and P_L is a population at a level L.

20. A method of processing an image, the method comprising:

capturing an image of an object;

classifying the image in a class using a concentration ratio;

using the class to modify the operation of an image capturing device; and

applying controlled, equalization to an image generated by the image capture device,

where the controlled, histogram equalization uses a concentration ratio.

21. An image processing system comprising:

an image capture device;

an image classifier coupled to the image capture device in a feedback loop; and

a controlled, equalization processor coupled to the image capture device.

22. An image processing system comprising:

2 an image capture device configured to capture an image; and
3 an image classifier coupled to the image capture device in a feedback loop, the image
4 classifier configured to determine a concentration ratio for the image, compare the
5 concentration ratio to at least one or more classification thresholds, and classify the image
6 based on the comparison of the concentration ratio to at least one of the one or more
7 classification thresholds.

1 23. A computer-readable medium containing instructions for processing an image by:
2 obtaining an image;
3 determining one or more classification thresholds;
4 determining the concentration ratio for the image;
5 comparing the concentration ratio to at least one of the one or more classification
6 thresholds; and
7 classifying the image based on the comparison of the concentration ratio to at least
8 one of the one or more classification thresholds.